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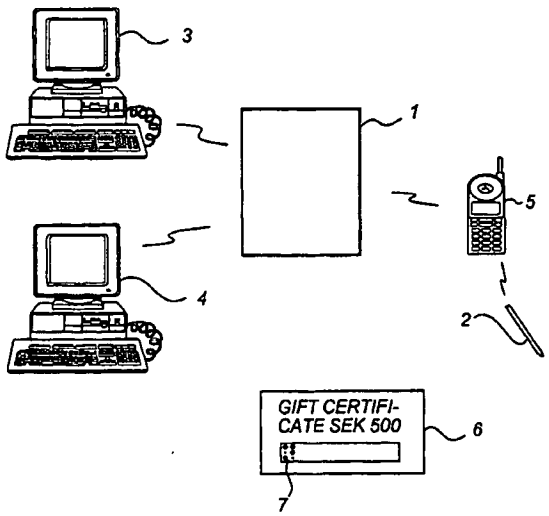
(54) Title: MANAGEMENT OF VALUABLE DOCUMENTS, BY ASSOCIATING A VALUABLE DOCUMENT WITH A SUBSET OF A POSITION-CODING PATTERN



(57) Abstract: A method for management of valuable documents (6). The method is carried out in a computer (1) which is connected to a computer network and comprises the steps of receiving an order from the computer network relating to a valuable document (6), and, in response to the order, creating said valuable document (6). The document creation comprises the step of associating the valuable document (6) with a subset of a position-coding pattern (7). When the valuable document is checked when used, a control signal comprising at least one pair of coordinates, which has been recorded by reading the position-coding pattern on the valuable document, is received. It is determined to which coordinate area the pair of coordinate belongs and on the basis of this coordinate area the acceptability of the valuable document is checked. Corresponding computer program products and arrangements are also described.

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Management of valuable documents, by associating a valuable document with a subset of a position-coding pattern.

Field of the Invention

The present invention relates to methods for management of valuable documents, which methods are carried out in a computer which is connected to a computer network. The invention further relates to arrangements for management of valuable documents as well as to computer program products.

Background of the Invention

Nowadays, there are various types of valuable documents which, at defined locations, function as means of payment for products or services or as evidence of a payment already made for a product or a service. There are also valuable documents which function as reservations for products or services.

A gift certificate, which can be used in one or more specified shops, is an example of a valuable document. One of the advantages of the gift certificate is that the person giving the gift certificate can save time by not having to spend time in a shop looking for a suitable present. The person wishing to give a gift certificate goes to a shop where the desired gift certificate is available and purchases it. He or she can then send the gift certificate by post or give it in person to the intended recipient. The recipient of the gift certificate can then, by showing the gift certificate, make a purchase corresponding to the sum indicated on the gift certificate. As a rule, the authenticity of the gift certificate is only cursorily checked, which entails the risk that a falsified gift certificate is accepted as a means of payment. The owner's right to use the gift certificate is also seldom checked, which means that stolen gift certificates can be used unduly.

Another example of a valuable document is a cinema ticket. Today it is possible to order cinema tickets via

the Internet by visiting a cinema's home page and choosing a movie and a desired performance. In addition, one also gives one's telephone number, which becomes the booking number. The tickets then have to be collected some time, often a full hour, before the performance starts.

Summary of the Invention

An object of the invention is therefore to enable a faster and easier way of managing valuable documents.

Another object is to enable a more secure way of managing valuable documents

These and other objects are achieved by methods according to claim 1 and claim 15, computer program products according to claims 21 and 22, as well as arrangements according to claims 23 and 25.

More precisely, the invention relates, in a first aspect, to a method for management of valuable documents, which method is carried out in a computer which is connected to a computer network, the method comprising the steps of receiving an order from the computer network relating to a valuable document, and, in response to the order, creating said valuable document, which comprises the step of associating the valuable document with a subset of a position-coding pattern.

The association of the valuable document with a subset of a position-coding pattern makes it possible to check that a valuable document is used only in the intended way. By that sending of the valuable document, e.g. in electronic format, to the person ordering it or to a specified recipient, can be permitted, thus making the acquirement of the valuable document faster and easier.

The step of associating the valuable document with a subset of the position-coding pattern may involve the printing of the valuable document with the subset of the position-coding pattern on the valuable document. It can also imply that the computer creates one or more

electronic files which make it possible for the recipient himself to print the valuable document with the subset of the position-coding pattern.

An advantage of this ordering method is that it permits ordering of valuable documents from a computer or mobile phone.

The valuable document can be free of charge, for example to attract the visitor to an Internet site, or require payment.

According to a preferred embodiment, the position-coding pattern codes coordinates of points on an imaginary surface, the subset of the position-coding pattern coding coordinates within one coordinate area of a plurality of coordinate areas which are defined in the computer.

Thus, the subset on the valuable document codes coordinates within a specific coordinate area. Thus, one pair of coordinates suffices for establishing to which coordinate area the subset of the valuable document corresponds. Since a plurality of coordinate areas is defined in the computer, a plurality of unique valuable documents can be created.

In one embodiment of the method, the step of creating said valuable document comprises storinginformation to the effect that said one coordinate area is reserved.

The advantage of this information is that the computer can quickly check whether the coordinate area can be assigned a new order for a valuable document. When a coordinate area is to be chosen for a new order, a coordinate area is chosen which is not reserved.

According to one embodiment of the method, the step of creating said valuable document comprises the step of storinginformation to the effect that said one coordinate area is usable.

The coordinate area and thus the valuable document can be marked as usable directly at the time the valuable document is created. It can also be marked as non-usable

directly at the time it is created and then marked as usable when a payment for the valuable document has been received.

In one embodiment of the method, the step of creating said valuable document comprises the step of associating an address with said one coordinate area.

Associating an address with the coordinate area has the advantage that it is possible to send a message to this address relating to the valuable document. For example, this can be the address of the person making an order or the address to the person who is to receive a valuable document.

In one embodiment of the method the step of creating said valuable document comprises associating an amount with said coordinate area.

The amount may for example be the amount of a gift certificate or the amount of a cash card. As a result of the amount being associated with the coordinate area, use can be made of the valuable document in several steps, the amount being counted down step by step.

According to one embodiment of the method the step of creating said valuable document comprises storing an identifier identifying a user unit, which is authorised to read said subset of the position-coding pattern.

With the aid of the identifier a valuable document can be tied to a specific user unit and in that way the security can be increased. Only reading made by the indicated user unit, which may be the personal user unit of the gift certificate's owner, is accepted. Alternatively, the indicated user unit may belong to a company or establishment where the valuable document can be utilised. In this way, attempts to utilise the valuable document at improper places can be warded off.

One embodiment of the method further comprises the step of forwarding the valuable document.

The valuable document can, for instance, be sent by normal post, which means that persons not connected to the network can receive the valuable document.

Preferably the valuable document is, however, forwarded electronically via the computer network.

An advantage of this is that the person placing the order for a valuable document can get it sent quickly to him. For example, it can be sent by e-mail. Alternatively, the valuable document can be sent directly to a specified person. The valuable document can be sent as a pdf file. The valuable document can then be printed out with the associated position-coding pattern. A further advantage of the possibility of sending the valuable document with the associated pattern electronically is that a company, for example, can itself print out the valuable document.

In one embodiment, the valuable document is associated with a unique subset of the position-coding pattern.

An advantage of this is that each valuable document is unique. The position-coding pattern means that it is possible to define a position globally in a large position-coding pattern. This means that security can be increased, since the unique pattern also permits different checks to be made of the valuable document. It is more difficult to use a copied or falsified valuable document.

For the purpose of checking the valuable document, one embodiment of the method may further comprise the steps of receiving a control signal comprising at least one pair of coordinates recorded from the valuable document, determining to which coordinate area of said plurality of coordinate areas said pair of coordinates belongs, and checking, on the basis of the determined coordinate area, whether the valuable document is acceptable.

This method of checking is easy and flexible.

One embodiment of the method comprises the step of marking the determined coordinate area as used.

A valuable document can be used one or more times. If the valuable document can be used several times, the computer can indicate each instance of use of the valuable document when a control signal is received. When the valuable document has been used the permitted number of times, the coordinate area and thus the valuable document is marked as being used up. When the valuable document has been used up, the coordinate area can be marked as vacant and it can be reserved for a new order. This can be done directly or after a certain period of time.

According to one embodiment of the method, a message included in the control signal is forwarded to an address associated with the determined coordinate area.

An advantage of being able to send a message is that the person using the valuable document can send a message to the effect that he or she has used the valuable document. If the valuable document is a gift certificate, for example, the message can be a thank you for the gift certificate.

The address can have been stored at the time of ordering of the valuable document. In the case where the valuable document is a gift certificate, the address can be the address of the person placing the order. An address can, for example, be a mobile phone number or an e-mail address to which a text message can be sent. The address can also be a normal postal address to which a message can be sent by normal post after it has been printed out.

According to a second aspect, the invention relates to a method for management of valuable documents, the method being carried out in a computer, which is connected to a computer network. The method is characterised in that a plurality of coordinate areas is defined in the computer and by the steps of receiving a control signal from the computer network, which control

signal comprises at least one pair of coordinates, which has been recorde by reading of a position-coding pattern on a valuable documentdetermining to which coordinate area of a plurality of coordinate areas the pair of coordinates belongs and checking, with the aid of the determined coordinate area, whether the valuable document is acceptable.

This method for checking whether a valuable document is acceptable or not is simple and very flexible since different criteria for the acceptability can be associated with the coordinate area. Furthermore, only a small amount of information need be recorded and transferred in order to make possible the check. Moreover, the check can be made in real time.

The method for checking can be used for valuable documents that have been ordered and created with the above-described method or for valuable documents which have been ordered and created in other ways, for instance printed in an ordinary printing works or purchased directly in a shop.

One embodiment of the method further comprises the step of transmitting a signal to the computer network in order to indicate the acceptability of the valuable document.

The advantage is that the person who is to receive a valuable document, e.g. as a means of payment in a shop, can get an immediate signal as to its acceptability or validity. The signal can be, for example, only an indication as to whether the valuable document is acceptable or not. The signal can also include further information, for example showing why a valuable document cannot be accepted. In addition, the signal can include information on, for instance, the value of the valuable document or the amount remaining after a payment.

The method can furthermore comprise the step of marking the determined coordinate area as used. In this

way, use of copies of the valuable document can be prevented.

The coordinate area may be marked as used after one or more uses or after a predetermined number of uses. In the latter case, a marking can be made for each time the valuable document is used, the valuable document being useless when the valuable document have been used the predetermined number of times.

The method can furthermore comprise the steps of identifying a signature in the received control signal and associating the signature with the determined coordinate area.

An advantage of the position-coding pattern is that it can be used for recording handwriting, e.g. a signature. The requirement that a person using the valuable document must write his signature on the valuable document increases security. On the one hand the signature can be checked against an identity paper, on the other hand the signature can be stored and checked if a dispute regarding the use of a valuable document arises in the future.

The method can also comprise the step of identifying a payment amount in the received control signal and of comparing the payment amount with a total amount associated with the determined coordinate area.

This step can be used for increasing security so that use of a valuable document on which the owner has changed the amount can be prevented. The payment amount need not correspond to the total amount. If the payment amount does not come up to the total amount, the payment amount can be deducted from the total amount and the remaining amount recorded as a new total amount.

The method can furthermore comprise the step of identifying, in said control signal, an identifier, which indicates the identity of a user unit which has been used for reading the position-coding pattern on the valuable document, in which method the step of controlling

comprises comparing the identifier in the control signal with an identifier associated with the determined coordinate area.

An advantage of this embodiment is that security is increased since the valuable document is accepted only if the position-coding pattern has been read with the proper user unit. To fool the system, it does consequently not suffice to have access to a specific valuable document, but access to the indicated user unit is moreover required.

The identifier can be stored beforehand, e.g. when specific coordinate areas are reserved for a certain shop, or in connection with the order.

Preferably, both the method used for providing a valuable document and the method used for checking a valuable document are implemented with the aid of computer software.

According to a third aspect, the invention thus relates to a computer program product comprising program code which when loaded into a computer is arranged to execute the above-described method for providing a valuable document.

According to a fourth aspect, the invention also relates to a computer program product comprising program code which when loaded into a computer is arranged to execute the above-described method for checking a valuable document.

According to a fifth aspect, the invention relates to an arrangement for management of valuable documents in a computer, which is connected to a computer network. The arrangement is characterised in that the arrangement comprises means for receiving an order from the computer network relating to a valuable document, and means for creating said valuable document and for associating the valuable document with a subset of a position-coding pattern.

One embodiment of the arrangement further comprises means for carrying out said order for a valuable document.

The means for ordering is advantageously a web site at which information can be entered in the order.

According to a sixth aspect, the invention relates to an arrangement for management of valuable documents in a computer, which is connected to a computer network. The arrangement is characterises in that a plurality of coordinate areas is defined in the computer and in that the arrangement comprises means for receiving a control signal from the computer network, the control signal comprising at least one pair of coordinates which has been recorded by reading a position coding pattern on a valuable document, means for determining to which coordinate area of said plurality of coordinate areas the pair of coordinates belongs and means for checking with the aid of the determined coordinate area, if the valuable document is acceptable.

The advantages mentioned under the first aspect of the invention apply also to corresponding parts in the second, third, fourth, fifth and sixth aspects of the invention.

Brief Description of the Drawings

The invention will be described in greater detail below with reference to the accompanying drawings, in which

Fig. 1 schematically shows a system in which methods for management of a valuable document can be implemented;

Fig. 2 schematically shows an example of a user unit, which can be used in connection with a valuable document;

Fig. 3 schematically shows an example of a storage structure for storing, inter alia, control information in a server unit;

Fig. 4a schematically shows a first flow chart for ordering a valuable document according to one embodiment of the invention, and

Fig. 4b schematically shows a second flow chart for checking of a valuable document according to one embodiment of the invention.

Description of a Preferred Embodiment

Fig. 1 shows an example of a system for management of valuable documents. The system comprises essentially a server unit 1, a user unit 2, an ordering computer 3, a receiving computer 4, a network connection unit 5, and a valuable document 6.

The server unit 1 is a computer in a network of computers. It is designed as a traditional server unit with one or more processors, memory of different types, peripherals, and connections to other computers in the network, but is contains novel software for executing the functions described here. It also has information stored in its memory for executing these functions.

The server unit does not need to be part of a global network, and instead it can be included in a local network and used to process valuable documents within a company.

In a memory of the server unit 1, a plurality of coordinate areas is defined. The coordinate areas are used for management of valuable documents. Each coordinate area corresponds to a subset of a position-coding pattern. The position-coding pattern codes coordinates of points on at least one imaginary surface. The imaginary surface can be said to be a surface in a system of coordinates, which surface thus contains a large number of points which are arranged systematically in two dimensions with a certain given resolution. Each point can be defined with two coordinates. If there is more than one imaginary surface, more than two coordinates may be needed for defining a point.

On the imaginary surface a plurality of coordinate areas can be defined. The coordinate areas can be of different sizes and can have different shapes. The smallest possible coordinate area comprises a single point on the surface. It is not necessary for the whole surface to be taken up by coordinate areas. The different coordinate areas are defined in the server unit. A rectangular coordinate area, for example, can be described with the aid of pairs of coordinates representing the points at the corners of the domain.

For each coordinate area information regarding a valuable document, provided with the corresponding position-coding pattern, can be stored. An example of a valuable document 6 in the form of a gift certificate, which is provided with a subset of a position-coding pattern, is shown in Fig. 1.

Fig. 3 shows an example of a row in a table for storing information about valuable documents. In a first column 30 of the table a coordinate area on the imaginary surface is defined with the aid of the coordinates (x1,y1; x2,y2; x3,y3; x4,y4) for the corners of the coordinate area, which is here assumed to be rectangular.

A second column 31 defines whether the coordinate area is reserved or not.

A third column 32 shows whether the valuable document which is associated with a subset of a position-coding pattern which corresponds to the coordinate area of the first column has already been used.

In a fourth column 33, a user unit's identity is stored in the form of a serial number. This column can be used for checking from which user unit the payment is made using the valuable document. Sending the user unit's serial number increases security since it is possible to ensure that payment can only be made from user units with specified serial numbers.

The table can include further columns. One column could be intended for an amount which corresponds to the

value of the valuable document. The valuable document could be used more than once if its owner does not use the full amount the first time. The server unit then reduces the value of the valuable document. The valuable document may thus be a cash card.

A further column could include a validity date indicating the last date for using the valuable document. If this date is exceeded the valuable document is being marked as used in the third column such that it can no longer be used.

A still further column could be used for storing an address, e.g. to a recipient of the valuable document or to the person ordering the valuable document.

Yet another column could be used for defining a receiver of the payment for the valuable document when this payment is obtained from the person placing the order for the valuable document.

A column or some other memory area which is associated with the coordinate area in the first column could also be intended for logging of signatures which are written on a subset of the position-coding pattern which corresponds to the coordinate area of the first column.

Of course, this is a very simple structure which is only used to illustrate the principles involved. Considerably more complex structures and rules for security checking are conceivable. Other structures for storing the above-mentioned information and other items of information regarding valuable documents can be used.Fig. 2 shows an example of a user unit 2 in the form of a digital pen which can be used for reading a position-coding pattern on a valuable document. It comprises a casing 11 which is shaped approximately as a pen. In one short side of the casing there is an opening 12. The short side is intended to rest against or be held at a short distance from the surface from which the position-coding pattern is to be read. The casing essentially

includes an optics part, an electronics part and a power supply.

The optics part comprises at least one light emitting diode 13 for illuminating the surface which is to be imaged and a light-sensitive area sensor 14, for example a CCD or CMOS sensor, for recording a two-dimensional image. The user unit may additionally contain a lens system.

The power supply to the user unit is provided by a battery 15 which is mounted in a separate compartment in the casing. It may also be provided via a cable.

The electronics part comprises a processor 16 which is programmed to read an image from the sensor 14, identify symbols in the image, determine which two coordinates the symbols code for, and store these coordinates in its memory. Finally, the processor is programmed to generate a message which contains the coordinates and a unique user identity which is stored in the user unit, and to send this information to the server unit 1 via a transceiver 19 and the network connection unit 5. The processor can also be programmed to analyse several recorded pairs of coordinates, convert these to a train of polygons constituting a description of how the digital pen has been moved over the surface of the valuable document, and generate a message which includes the train of polygons.

The processor 16 does not need to send all the information on to the server unit 1. The processor 16 can be programmed to analyse the recorded coordinates and only to send on information which is represented by coordinates within a specified coordinate area. For example, the user unit 2 can belong to a shop and also recognise within which area the coordinates for this shop's valuable documents lie. If the recorded coordinates lie outside this area, the user unit indicates that the valuable document cannot be used in this shop.

The user unit 2 moreover comprises buttons 18 with which the unit is activated and controlled. As already mentioned, it also has a transceiver 19 for wireless communication, e.g. by IR light or radio waves, with external units, such as the network connection unit 5.

The user unit 2 is arranged to transmit the control signal to the server unit 1. In this example, the information is transmitted wirelessly to the network connection unit 5, which in turn transmits the information to the server unit 1.

In this example, the network connection unit is a mobile phone 5. It can alternatively be a computer or another suitable unit which has an interface to a network, for example the Internet or a local company network.

The network connection unit 5 can alternatively constitute an integrated part of the user unit 2.

The communication between the user unit and the network connection unit, which are normally fairly near each other, can be by IR or radio waves, e.g. according to the Bluetooth technology, or some other technology for transferring information over short distances. The information transfer does not need to be wireless, and instead can be by cable.

General example of application

A description of how a valuable document could be ordered and created will now follow. The description is made with reference to the flow chart of fig 4a.

Assume that a user wants to place an order for a valuable document. He then connects his computer 3 to the server unit 1 and opens an ordering form. He enters all items of information needed for the placing of the order.

The information includes how the payment for the valuable document is to be carried out. The user can e.g. indicate a number of an account, from which the payment is to be deducted. The account can be an account of the provider of the valuable document, into which the user previously has made a deposition. The account can also be

an ordinary bank account or the like. As another example, the user can indicate that he wants to be sent an invoice which he then pays. As yet another example the user can indicate that he want a cash-on-delivery valuable document.

The order of the valuable document 6 is received by the server unit in step 100 of fig 4a. In a coordinate area selection step 110, the server unit chooses a vacant coordinate area, i.e. a coordinate area not already reserved for a valuable document. In an association step 120, the subset of the position-coding pattern corresponding to the chosen coordinate area is then associated with the ordered valuable document 6. In a reservation step 130, the server unit then stores information to the effect that the domain is reserved for the ordered valuable document 6. In a storage step 140, the server unit can also store other information, such as, for example, if the valuable document is to be valid from a certain date, or other information which can be used to check the valuable document.

The position-coding pattern 7 has the feature that if any part of the pattern of a certain minimum size is recorded, its position in the position-coding pattern and thus on the valuable document can be unambiguously determined.

The position-coding pattern 7 can be of the type disclosed in above-mentioned US 5,852,434, in which each position is coded by a specific symbol.

However, the position-coding pattern is advantageously of the type which is disclosed in Applicant's International patent applications WO 00/73983 and WO 01/16691, in which each position is coded by a plurality of symbols and each symbol contributes to the coding of a plurality of positions. WO 00/73983 and WO 01/16691 are hereby incorporated by reference.

The position-coding pattern is built up from a small number of types of symbols. An example is disclosed in

WO 00/73983 where a large dot represents a "one" and a small dot represents a "zero". Another example is disclosed in WO 01/16691, where four different displacements of a dot in relation to a raster point codes four different values. The position-coding pattern can be invisible to the user.

Then, in a forwarding step 150, the server unit 1 forwards the valuable document to the recipient specified in the order. The valuable document can be sent electronically to a receiving computer 4 or by normal post. If the valuable document is sent electronically, the recipient can print out the valuable document on a printer. The recipient can be the same person as the person placing the order.

The sending of the valuable document can be deferred until payment of the valuable document has been received. As an alternative, the marking of the valuable document as usable can be deferred until payment has been received.

When the valuable document is to be used, the position-coding pattern on the valuable document is read by means of a user unit, which is placed on the position-coding pattern so that a small part of this, in the extreme corresponding to the coordinates of a single point, is read. The use of the valuable document can also require that the user writes his signature on the position-coding pattern with the aid of a pen point placed on the user unit, which in a running manner records the coordinates of the user unit's positions on the position-coding pattern so that a description of the movement of the user unit is obtained. The user can also or alternatively write other information on the position-coding pattern.

The user unit creates, on the basis of the read position-coding pattern, a control signal which is received by the server unit 1, in a receiving step 200 of the flow chart of fig 4b. The control signal may consist

of a message of predetermined format. It comprises at least one pair of coordinates.

When the server unit has received the control signal, the server unit, in a determination step 210, determines to which coordinate area the pair of coordinates belongs. The acceptability of the valuable document is then decided in an acceptability step 220. The server unit 1 checks whether the valuable document has already been used. It can also check the user unit's serial number which can be received in the control signal. This affords increased security since a particular user unit 2 can be required in order for the valuable document 6 to be used. If the control signal comprises a signature, this signature can be verified and/or stored to be used if a dispute about the valuable document arises. The control signal can further comprise information which identifies the establishment where the valuable document is used. Such information can be checked against information which is associated with the relevant coordinate area. The control signal can also include an amount, which can be compared with the total amount associated with the relevant coordinate area. It can be deducted from the total amount. The remaining amount is then stored as a new total amount.

If the valuable document is accepted, the server unit marks, in a marking step 230, the valuable document as used, so that it will not be able to be used again.

In a signalling step 240, the server unit then emits a signal which indicates the acceptability of the valuable document, i.e. the result of the check. The signal is sent to the user unit 2 or to another predetermined unit.

The coordinate area which corresponds to the used valuable document can, directly or after a certain time, be marked as vacant, i.e. not reserved. The coordinate area can then be associated with a new valuable document. Suitably, the coordinate area may then be used for

another type valuable document, which is valid for another product or service and/or together with another user unit so that the risk for a further use of an already used up valuable document is lessened.

In connection with the use of the valuable document an amount previously paid by the person placing the order of the valuable document can be transferred to the establishment where the valuable document is used. The transfer can also be made earlier, e.g. in connection with the payment.

Valuable documents can be used as means of payment in a number of different fields, for example in a chain of shops, in a restaurant, in a cinema, or in another type of operation where payment can be made with valuable documents.

Each shop can have its own server unit with information concerning its own valuable documents. There can also be a central server unit which has a certain number of coordinate areas reserved for each of the shops and which has stored information concerning which coordinate areas belong to which shops. The shops can have purchased a certain number of coordinate areas. To increase the flexibility of the system, it is desirable to be able to use any user unit without having to install special software in it for each shop. The information concerning payment can therefore be sent via the central server unit which, with the aid of the recorded coordinates, can decide to which coordinate area the coordinates belong and thus also decide to which shop the valuable document belongs. The information is then sent on to the shop's server unit in which more detailed control information is stored, or processed directly in the central server.

Gift certificate application

A person ordering a gift certificate remembers that it is his brother's birthday and wants to give him a gift certificate 6. The person ordering the gift certificate has a computer 3 with Internet access and he uses this

to visit the home page of the company "Shop and Buy". On this home page, he is able to order gift certificates which can be used in a large number of shops connected to the "Shop and Buy" gift certificate management server 1. The person ordering the gift certificate places an order for a gift certificate 6. He enters the total value of the gift certificate, which is SEK 500, his brother's e-mail address, and his own credit card number from which the cost of the gift certificate is to be deducted. The order is sent off to the "Shop and Buy" server. The server chooses a vacant coordinate area, i.e. a coordinate area which is not reserved for any other valuable document. Some of the order details received are stored. The coordinate area is marked as reserved and the sum on the gift certificate is entered. The valuable document is associated with the chosen coordinate area's subset of a position-coding pattern. The valuable document is then sent to the e-mail address of the brother of the person who ordered the gift certificate. The valuable document can be stored in a pdf file and sent via the computer network. The person's brother receives the gift certificate 6 on his computer 4 and prints it out.

Money is drawn from the specified credit card number and the gift certificate is marked as usable.

When the gift certificate recipient wishes to pay for something with the gift certificate 6, he hands it over at the cashdesk, and the cashier uses a digital pen belonging to the shop and places it against the gift certificate. The position-coding pattern of the gift certificate is read and converted to coordinates and sent, together with a serial number belonging to the pen, to the "Shop and Buy" server for checking. The "Shop and Buy" server searches for the coordinate area which is associated with the coordinates. It then checks if the gift certificate is valid, for example by checking that it has not already been used or that the last date of use

has not expired. It also checks to ensure that the pen's serial number corresponds with the serial number of the pen which is authorised to record the gift certificate. After checking, the server can mark the gift certificate as used, so that it cannot be used again. Immediately after a gift certificate has been marked as used, the coordinate area can be marked as not reserved. This can also be done after a certain period of time.

If the gift certificate is not acceptable, a signal with information concerning this is sent to the digital pen. The information can include the reason for the gift certificate being invalid. If the gift certificate is valid, a clearance signal is sent to the cashier. The signal to the pen can also include information concerning the value of the gift certificate. The information concerning the validity can be displayed on a computer with which the pen communicates.

If the user is not buying something for the full value of the gift certificate, the purchase sum can be sent together with the coordinates to the "Shop and Buy" server. The server can deduct the sum associated with the read pattern, and the gift certificate can be used again.

Cinema tickets, for example, can be booked in a similar way to the management of gift certificates.

Restaurant vouchers

A restaurant may, for advertising purposes, issue vouchers for different meals. The restaurant may also sell a complete book of vouchers which can be used for payment in the restaurant. To increase security, these are each provided with a subset of a position-coding pattern so that they can be recognised in a simple manner. When a customer pays with the voucher, the cashier places a digital pen against the voucher and part of the position-coding pattern is recorded and converted to coordinates. The coordinates are sent on to a server which checks whether the voucher is valid. In the server there are a number of coordinate areas. The coordinate area to

which the coordinates belong is searched for and stored details of the voucher are checked. The cordinate area is then marked as used and the voucher is thus rendered unusable.

Traveller's checks

When travelling abroad, one does not want to carry about too much cash because of the risk of robbery and theft. The traveller can order traveller's checks for the desired amount via a computer with Internet access. The traveller gives his credit card number which, together with other order information, is sent to a server unit. The traveller can specify the dates for which he wishes the traveller's checks to be valid, which should preferably be the days when the traveller is to be travelling. This reduces the risk of the traveller's checks being used by an unauthorised person. The amount for which the traveller's checks are worth is drawn from the credit card. The traveller's checks are associated with certain coordinate areas in the server unit and are provided with the subsets of a position-coding pattern which are associated with these coordinate areas. The traveller's checks are sent electronically to the traveller, who prints out the traveller's checks on a printer. When the traveller wishes to pay with his traveller's checks, someone at the point of purchase enters two coordinates on the valuable document with a digital pen. The recording may be supplemented by the traveller's signature. The digital pen forwards the recorded information together with the pen's serial number to the server unit in which the details of the traveller's check are stored. The server checks the coordinate area to which the entered coordinates belong. The server checks that the check is valid. The pen's serial number informs the server of where the purchase took place. The coordinate area and thus the traveller's check are then marked as used in the server unit, and the used traveller's check is then invalid.

Messages

It may be possible to write a message on a valuable document, which message can be forwarded to an address stored in the server. The message is written by a user unit on the position-coding pattern.

If the valuable document is a gift certificate, for example, the person ordering the gift certificate can give his mobile phone number when ordering. The server receives the order, chooses a vacant coordinate area and stores the mobile number together with certain other order details in the server. The gift certificate is sent to the person who has been specified in the order. When the person who has received the gift certificate uses it, he can write a message on the gift certificate using a digital pen. The message is recorded by the digital pen and sent to the server. The server receives the signal and searches for the coordinate area associated with the gift certificate. The server checks the acceptability of the gift certificate. If it is acceptable, the message is sent on to the mobile number which was given when ordering the gift certificate. In this way, the person who ordered the gift certificate can tell that the gift certificate has been used. The person who received the gift certificate can in this way thank the person who sent it.

Although specific embodiments of the invention have been described above, it will be evident to the skilled person that many alternatives, modifications and variations are possible on the basis of the above description.

CLAIMS

1. A method for management of valuable documents (6), the method being carried out in a computer (1) which is connected to a computer network, c h a r a c t e r i - s e d by the steps of

receiving (100) an order from the computer network relating to a valuable document (6), and,

in response to the order, creating said valuable document, which comprises the step of

associating (120) the valuable document with a subset of a position-coding pattern (7).

2. The method according to claim 1, wherein the position-coding pattern codes coordinates of points on an imaginary surface and wherein said subset of the position-coding pattern codes coordinates within one coordinate area of a plurality of coordinate areas which are defined in the computer.

3. The method according to claims 1 or 2 wherein the step of creating said valuable document comprises the step of storing information to the effect that said one coordinate area is reserved (130).

4. The method according to any one of the preceding claims, wherein the step of creating said valuable document comprises the step of storing information to the effect that said one coordinate area is usable (140).

5. The method according to any one of the preceding claims, wherein the step of creating said valuable document comprises the step of associating an address with said one coordinate area.

6. The method according to any one of the preceding claims, wherein the step of creating said valuable document comprises associating an amount with said one coordinate area.

7. The method according to any one of the precediing claims, wherein the step of creating said valuable

document comprises associating an identifier, which identifies a user unit which is authorised to read said subset of the position-coding pattern, with said one coordinate area.

8. The method according to any one of the preceding claims, wherein the step of creating said valuable document comprises storing an indication of a payment recipient, to whom the payment for the valuable document is to be transferred.

9. The method according to any one of the preceding claims, further comprising the step of forwarding the valuable document (150).

10. The method according to claim 9, wherein the document is forwarded electronically via the computer network.

11. The method according to any one of the preceding claims, wherein the valuable document is associated with a unique subset of the position-coding pattern.

12. The method according to any one of claims 2-11, further comprising the steps of

receiving (200) a control signal comprising at least one pair of coordinates recorded from the valuable document (6),

determining (210) to which coordinate area of said plurality of coordinate the pair of coordinates belongs, and

checking (220), on the basis of the determined coordinate area, whether the valuable document is acceptable.

13. The method according to claim 12, further comprising the step of marking (230) the valuable document as used.

14. The method according to claim 12 or 13, further comprising the step of forwarding a message included in the control signal to an address associated with the determined coordinate area.

15. A method for management of valuable documents, the method being carried out in a computer which is connected to a computer network, c h a r a c t e r i - s e d in that a plurality of coordinate areas is defined in the computer and by the steps of

receiving (200) a control signal from the computer network, which control signal comprises at least one pair of coordinates, which has been recorded by reading a position-coding pattern on a valuable document,

determining (210) to which coordinate area of said plurality of coordinate areas the pair of ccordinates belongs, and

checking, with the aid of the determined coordinate area, whether the valuable document is acceptable.

16. The method according to claim 15, further comprising the step of transmitting (240) a signal to the computer network to indicate the acceptability of the valuable document.

17. The method according to claim 15 or 16, further comprising the step of marking the determined coordinate area as used.

18. The method according to any one of claims 15-17, further comprising the steps of identifying a signature in the received control signal and associating the signature with the determined coordinate area.

19. The method according to any one of claims 15-18, further comprising the steps of identifying, in said control signal, a payment amount, and comparing the payment amount with a total amount associated with the determined coordinate area.

20. The method according to any one of claims 15-19, further comprising the step of identifying, in said control signal, an identifier which indicates the identity of a user unit which has been used for reading the position coding pattern on the valuable document, wherein the step of controlling comprises comparing the

identifier in the control signal with an identifier associated with the determined coordinate area.

21. Computer program product comprising program code which when loaded into a computer is arranged to execute the method according to any one of claims 1-14.

22. Computer program product comprising program code which when loaded into a computer is arranged to execute the method according to any one of claims 15-20.

23. An arrangement for management of valuable documents in a computer, which is connected to a computer network, c h a r a c t e r i s e d in that it comprises

means for receiving an order from the computer network (100) relating to a valuable document (6), and

means for creating said valuable document in response to said order and forassociating the valuable document with a subset of a position-coding pattern.

24. The arrangement according to claim 23, further comprising means for carrying out said order for a valuable document.

25. An arrangement for management of valuable documents in a computer which is connected to a computer network, c h a r a c t e r i s e d in that a plurality of coordinate areas are defined in the computer, and in that it comprises

means for receiving a control signal from the computer network, which control signal comprises at least one pair of coordinates (6) , which have been recorded by reading of a position-coding pattern on a valuable document;

means for determining to which coordinate area of said plurality of coordinate areas the pair of coordinates belongs, and

means for checking, on the basis of the determined coordinate area, if the valuable document is acceptable.

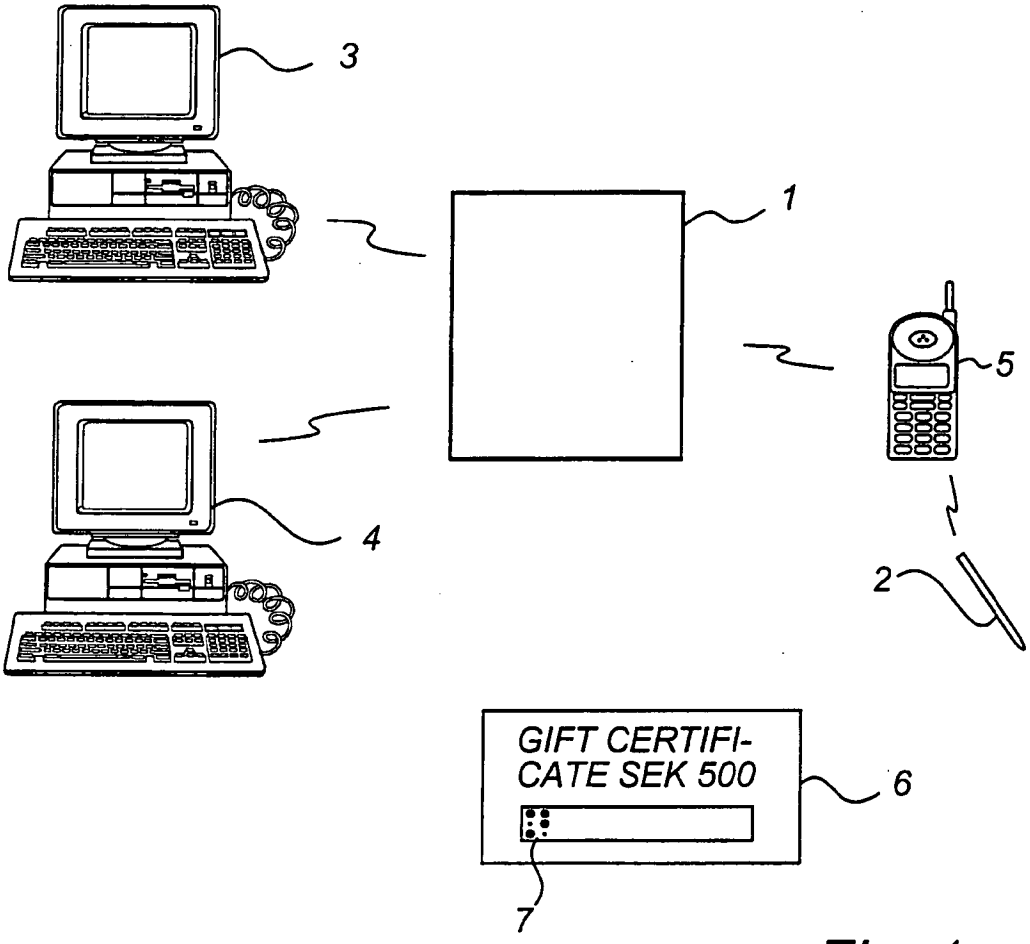

Fig. 1

30 Coordinate area	31 Reserved?	32 Used?	33 User-ID
$(X_1Y_1); (X_2Y_2)$ $(X_3Y_3); (X_4Y_4)$	YES	NO	123456789

Fig. 3

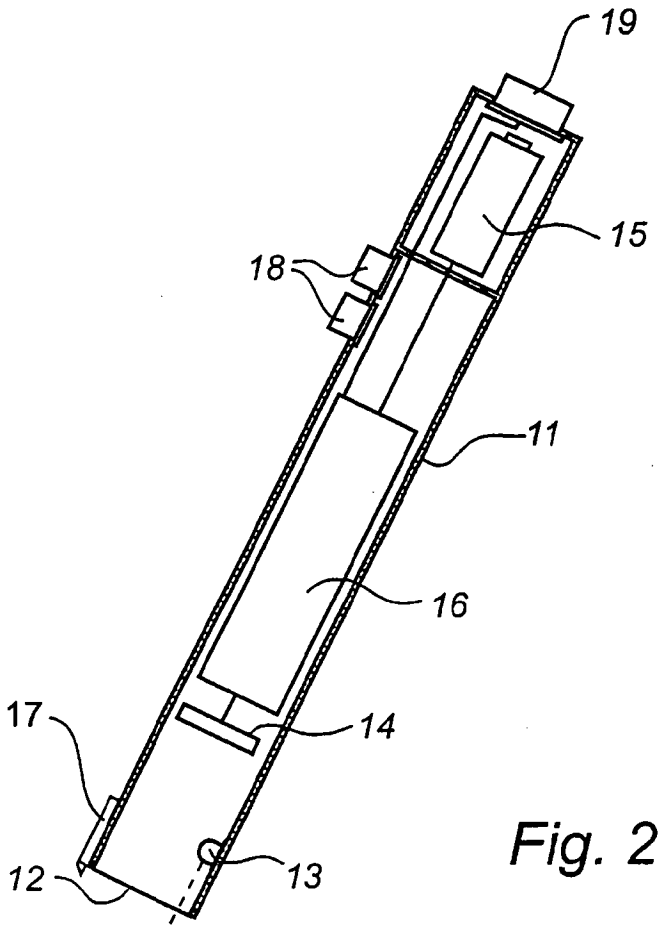

Fig. 2

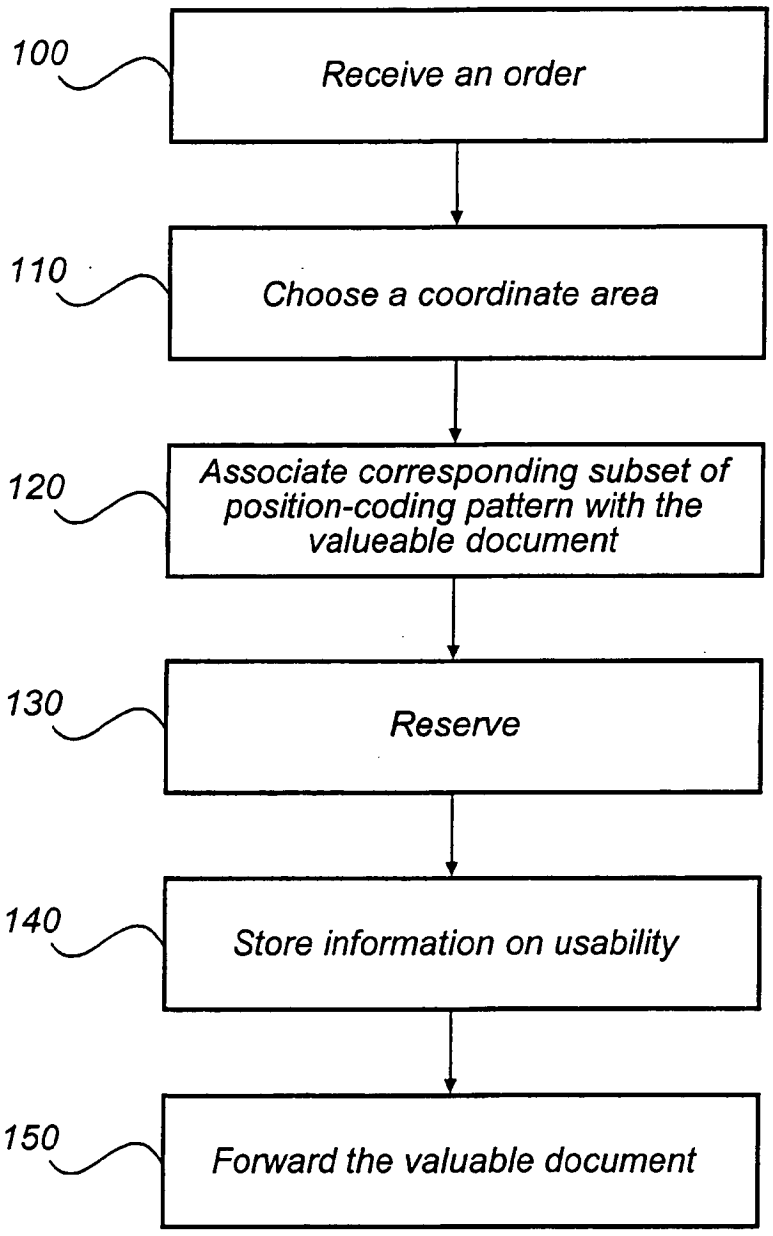

Fig. 4a

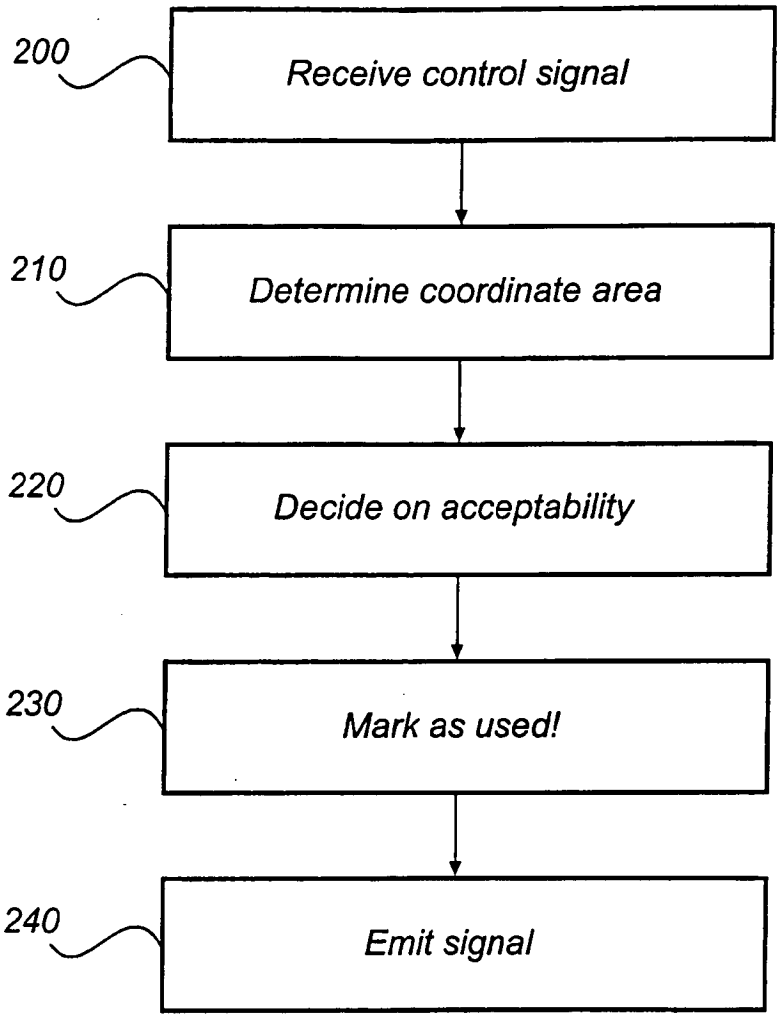

Fig. 4b

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 01/00590

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G06F 17/60
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0902352 A2 (FUJITSU LIMITED), 17 March 1999 (17.03.99) --	1-25
A	US 5334823 A (PAUL W. NOBLETT, JR. ET AL), 2 August 1994 (02.08.94) --	1-25

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
13 July 2001	16 -07- 2001
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Oskar Pihlgren/mj Telephone No. +46 8 782 25 00

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INTERNATIONAL SEARCH REPORT

Information on patent family members

02/07/01

International application No.
PCT/SE 01/00590

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0902352 A2	17/03/99	JP 11149454 A	02/06/99
US 5334823 A	02/08/94	CA 2086570 A	11/07/93
		US 5386458 A	31/01/95
		US 5432326 A	11/07/95

Form PCT/ISA/210 (patent family annex) (July 1998)